

# COMPILATION AND ASSESSMENT OF PIPING PLOVER WINTERING AND MIGRATORY STAGING AREA DATA IN NORTH CAROLINA

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**Abstract** – The coast of North Carolina provides important habitat for both migrating and wintering Piping Plovers (*Charadrius melodus*). All three geographic populations of this species are known to use the North Carolina coastline during the non-breeding season. Migrating and wintering Piping Plovers face a number of threats in the state including habitat loss and degradation due to development, chronic human disturbance and beach and inlet stabilization projects. In the past, surveys for non-breeding Piping Plovers were conducted primarily in an opportunistic fashion and not compiled in one location. In 2001, the North Carolina Wildlife Resources Commission created an Access database for non-breeding Piping Plover observations and compiled sightings in an effort to help identify some of the most important areas for non-breeding Piping Plovers. In recent years, systematic surveys conducted on Cape Hatteras and Cape Lookout National Seashores and at various locations in the state in association with beach stabilization projects coupled with the increase in sightings reported and the compilation of coast-wide data, have lead to an increase in our knowledge about non-breeding Piping Plovers in North Carolina. In addition, it has aided in the review of projects that have the potential to negatively impact Piping Plovers and in management efforts for non-breeding plovers. Much is still to be learned about non-breeding Piping Plovers in the state and the impacts of the aforementioned threats. Additional systematic surveys are needed in other areas along the coast such as difficult to reach shoals and more frequent surveys are required along sites of known importance to further our understanding of migrating and wintering Piping Plovers in the state.

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## INTRODUCTION

North Carolina is important to Piping Plovers (*Charadrius melodus*) during all stages of their life cycle. The state represents the northern extreme of the wintering range, the southern extreme of the breeding range and is a very important stop over area during spring and fall migration. The species can be observed in North Carolina every month of the year, and all three geographic populations of Piping Plovers are known to use the North Carolina coastline during the non-breeding season.

North Carolina's Piping Plovers face numerous threats. Of greatest concerns to wintering and migrating birds are habitat loss and degradation from development and beach stabilization and chronic human disturbance. Development continues at a fast pace along our coastline and beach stabilization projects are on the rise in response to

increasing development. North Carolina has several 50-year beach nourishment projects in the planning and development phases and inlet maintenance and beach disposal is a common practice. Channel relocation projects to protect development are also becoming more common. Such practices lead to more development as inlet spits widen and become stabilized and people become more inclined to build houses close to inlets. Even in areas with little development, there can be a significant loss of habitat. For example, approximately 56 miles of dune along Cape Hatteras National Seashore and Pea Island National Wildlife Refuge have been maintained since the 1930s to protect State Highway 12, which runs down the length of the island (USFWS 1996). Human disturbance is also on the rise at many locations along the coast. In the past, places like Cape Hatteras National Seashore were primarily a summer destination. Today, large numbers of vehicles and people can be found on the beaches most months of the year.

Given the threats facing non-breeding Piping Plovers in North Carolina, it is important to collect information on distribution and abundance of birds at staging and wintering areas. This summary will highlight the history of non-breeding Piping Plover surveys in the state and the efforts that are currently underway to increase our knowledge in this area through additional surveys and the maintaining a database to house observations.

## METHODS

In the past, surveys for migrating and wintering Piping Plovers along North Carolina's coast were conducted primarily in an opportunistic fashion and numbers were not well documented. Some systematic surveys were conducted including International Piping Plover Census and Shorebird Migration Monitoring surveys, but these were infrequent and data was not compiled in one location. In 2001, the North Carolina Wildlife Resources Commission (NCWRC) obtained a grant from the U.S. Fish and Wildlife Service (USFWS) to compile Piping Plover observations in an Access database. The objectives of the creation of the database were to encourage documentation of more non-breeding observations, to compile data in one place to aid in permit review, and to identify the most important non-breeding sites. The database contains 24 fields including location, habitat, bands, season and activity. To date, close to 4,000 records have been compiled with observations spanning nearly 40 years. The database contains records from annual breeding season census windows, International Censuses (Haig and Plissner 1992, Plissner and Haig 1997, Ferland and Haig 2002), Shorebird Migration Monitoring surveys (ISS protocol), Carolina Bird Club data, Christmas Bird Counts, observations during colonial waterbird surveys, East Coast Winter Distribution Surveys (Nicholls 1989), work done under contract for NCWRC (Fussell 1990), surveys done as part of permit requirements for applicants of proposed projects, and other opportunistic surveys and observations.

In recent years, systematic surveys have been conducted at locations including Cape Hatteras and Cape Lookout National Seashores and several sites in association with beach stabilization projects. An observation form has been created and distributed, increasing the number of opportunistic sightings reported. Sites that have received

some level of survey effort either in the past or present cover several areas along the coast and include portions of Cape Hatteras National Seashore, Cape Lookout National Seashore, Pea Island National Wildlife Refuge, Bogue Inlet, Bear Island, Onslow Beach, Lea/Hutaff Island and adjacent inlet shoals, Mason Inlet, Bald Head Island and Brunswick County beaches. Survey methods vary widely depending on accessibility and manpower. Information from surveys where no plovers are seen is included in the database in order to better describe where plovers are not found as well as where they are found, however, these records are not numerous since most observers are reluctant to report negative data. While some of the surveys compiled in the database are systematic in nature, the database as a whole contains data that is neither systematic nor random.

## RESULTS

The development of an Access database and the increase in surveys have provided valuable information that aids in the protection of migrating and wintering Piping Plovers in North Carolina. The most important migratory stop over sites and wintering sites have been identified. These include portions undeveloped beaches along Cape Hatteras and Cape Lookout National Seashores, Bear Island, Bird Shoals, and Lea/Hutaff Island as well as some developed sites such as the west end of Bogue Banks and South Topsail Island. In addition to identifying the most important stop over and wintering sites, we have gained insight into spatial and temporal use of different habitats. For example, observations clearly indicate that birds move between different microhabitats within inlet complexes. Some sites are used exclusively for foraging while others are used for roosting; highlighting the need to protect an assemblage of microhabitats to protect the species. Not surprisingly we have found that, in general, areas that are good for migrating birds are also good for wintering birds. We see higher numbers in the fall with a spike in July/August and fewer in the winter and during spring migration when birds are quickly moving to breeding grounds. There are some sites, however, that appear to be especially important for migrants (e.g. Ocracoke Inlet) and some that appear to be more important for wintering birds (e.g. the west end of Shackleford Banks and Bird Shoals).

We have also gained valuable information from sightings of banded birds. To date, there are 481 records of banded plovers in the database. Of these, 279 have been identified to probable banding locations, many of which are repeat observations. At least 71 individual birds were identified including birds from all three geographic populations of Piping Plovers. We have witnessed site fidelity in several of the wintering birds as well as movement between adjacent areas depending on tide, weather and other factors.

The increased survey efforts coupled with the compilation of data into a database have proven invaluable when reviewing permits for projects that have the potential to negatively impact shorebird habitat. The database is utilized not only by NCWRC, but also by other agencies including the U.S. Army Corps of Engineers and USFWS. It also provides agencies and organizations with a source for data that support

recommendations to protect migrating staging and wintering areas from disturbance by recreationists and their pets.

## CONCLUSION

While we now have a good map of the locations of important migratory stop over sites and wintering sites for Piping Plovers in North Carolina, there is still a need for additional surveys. First, more frequent surveys are needed at important areas such as Cape Hatteras and Cape Lookout National Seashores. While these areas are surveyed anywhere from every ten days to monthly, we may need weekly or even daily surveys to fully understand habitat use and movements of plovers. We also need to remain committed to long-term monitoring of a few important sites so population fluctuations can be detected. Second, there is a need for surveys along barrier islands and within inlet complexes that currently aren't covered. Topsail Island, Masonboro Island, Carolina Beach, Fort Fisher State Park and Tubbs Inlet are currently not surveyed although we do have some opportunistic sightings of plovers in these areas. It is extremely valuable to collect information from developed barrier islands that are used by Piping Plovers so that we have some pre-project data when beach stabilization projects are planned. For example, wintering and migrating plovers utilize Topsail Island while the towns along Topsail Island are currently in the planning stages of a 50-year nourishment project as well as a channel relocation project. Having data from these areas is invaluable in reviewing such projects and, if needed, requesting appropriate mitigation. There is also a need for collection of longer term data in response to beach stabilization projects. Surveys for Piping Plovers are normally conducted for one or two years in response to a project, but the negative impacts of such projects may not be realized for many years. Finally, additional surveys are needed at difficult to reach islands and shoals such as Clam Shoal, located in the Pamlico Sound.

North Carolina has made great strides with respect to non-breeding Piping Plover monitoring, but there is still much to learn about non-breeding birds in the state and about the impacts of the previously mentioned threats. Additional systematic surveys are needed in other areas along the coast such as difficult to reach shoals and more frequent surveys are required along sites of known importance to further our understanding of migrating and wintering Piping Plovers in North Carolina. More research is needed to fully understand the impacts of off-road vehicles on Piping Plovers and the effects of beach stabilization projects. Finally, we need more synthesis and analysis of existing information to determine what we know and what new information is most valuable.

## REFERENCES

- Ferland, C.L., and S.M. Haig. 2002. 2001 International Piping Plover Census. U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Corvallis, Oregon. 293 pp.
- Fussell, J.O. 1990. Census of Piping Plovers wintering on the North Carolina Coast – 1989-1990. Unpublished report to the North Carolina Wildlife Resources Commission. 54 pp.

- Haig, S.M., and J.H. Plissner. 1992. 1991 International Piping Plover Census. Report to U.S. Fish and Wildlife Service Region 3, Division of Endangered Species, Ft. Snelling, Minnesota. 148 pp.
- Nicholls, J.L. 1989. Distribution and other ecological aspects of piping plovers (*Charadrius melodus*) wintering along the Atlantic and Gulf Coasts. M.S. Thesis. Auburn University, Auburn, Alabama. 150 pp.
- Plissner, J.H., and S.M. Haig. 1997. 1996 International Piping Plover Census. Report to U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Corvallis, Oregon. 231 pp.
- U.S. Fish and Wildlife Service. 1996. Piping plover (*Charadrius melodus*), Atlantic Coast Population, Revised Recovery Plan. Hadley, Massachusetts. 258 pp.